

Date: Thursday, 18/12/2008 9:01:43 AM
 User: Julie Dawson

Process Sheet

Customer :	CU-DAR001 Dart Helicopters Services	Drawing Name :	212/205 HIGH AFT X-TUBE ASSEMBLY
Job Number :	44155		
Estimate Number :	13218		
P.O. Number :		Part Number :	D212664201TRN
This Issue :	18/12/2008	S.O. No. :	
Prsht Rev. :	NC	Drawing Number :	D212-664-241 REV C
First Issue :	1/1	Project Number :	N/A
Previous Run :	41585	Drawing Revision :	C
	Type :	Material :	
	CROSSTUBES	Due Date :	25/12/2008
Written By :		Qty:	1 Unit Each
Checked & Approved By :	JUD 08.12.18		
Comment :	Est Rev:A 08-03-06 new issue DD verified by:ec Est Rev B 08.04.02 Removed polish EC verified DD		

Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :
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1.0	D6006129	Crosstube Material
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Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

• Pick:

Qty Part number Description Batch

1 D6006-129 Crosstube B38338

Check OD = 3.250"; ID = 2.220"

Q.m 09.01.06

2.0	MORI SEIKI	MORI SEIKI CNC LATHE LARGE
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Comment: MORI SEIKI CNC LATHE LARGE

1-Fill tube with sand & install plugs DT8534 on both ends as per Folio FA114

2-Turn first side as per Folio FA114

3- File transition lines smooth.

Q.m 09.01.06

3.0	QC1	INSPECT ALL DIM TO DIM SHEET
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Comment: INSPECT ALL DIM TO DIM SHEET

Q.m 09.01.06

4.0	MORI SEIKI	MORI SEIKI CNC LATHE LARGE
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Comment: MORI SEIKI CNC LATHE LARGE

1-Turn second side as per Folio FA114

2- File transition lines smooth.

3-Remove sand and plugs

4- scribe b # and P # as per dwg

Q.m 09.01.06

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: D212-64-201 PAR #: N/A Fault Category: Pol / X / Hbe NCR: Yes ☐ No ☒ DQA: P Date: 09/01/07
 Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR: <u>44155</u>		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
09.01.06	2	TAPER SHIFTED BY 0.297". CUFF LENGTH 4.940". OVERALL TUBE LENGTH UNAFFECTED.	<u>CP</u> 09.01.06 per 08/04/06	MACHINE OPPOSITE SIDE TO MATCH. CUFF LONG ENOUGH FOR SADDLE. SHIFT IN TAPER INCREASES OD BY 0.004", MEASURED OD STILL IN TOL. ACCEPTABLE.	<u>G.M.</u> 09.01.06	<u>S</u> 09/01/06	<u>CP</u> 09.01.06 per 08/04/06	<u>S</u> 09/01/06

NOTE: Date & initial all entries

Date: Thursday, 18/12/2008 9:01:43 AM
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Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 212/205 HIGH AFT X-TUBE ASSEMBLY

Job Number: 44155

Part Number: D212664201TRN

Job Number:



Seq. #:

Machine Or Operation:

Description :

5.0

QC1

INSPECT ALL DIM TO DIM SHEET



Comment: INSPECT ALL DIM TO DIM SHEET

Q.m 09.01.06 ①

6.0

QC8

SECOND CHECK



Comment: SECOND CHECK

AWM 9-01-06

①

7.0

HAND FINISHING1

HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

Chemical Conversion Coat as per QSI 005 4.1 within 24 hours of machining

8.0

QC3

INSPECT POWDER COAT/CHEMICAL CONVERSION



Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION

DP

9-1-7

9.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

Identify and stock in kanban rack

Location: X-TUBE CELL

AWM

9-01-07

①

10.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

DP 09/01/07

Job Completion



u 09.01.07

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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NOTE: Date & initial all entries

DART AEROSPACE LTD	Work Order: 44155
Description: Crosstube Assembly (205/212 High Aft)	Part Number: D212-664-241
Inspection Dwg: D212-664-241 Rev: C	Page 1 of 1

FIRST ARTICLE INSPECTION CHECKLIST

☒ First Article ☐ Prototype

Inspection Sheet Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	0.200	+/-0.010	0.200	/		
	R0.063	+/-0.010	R0.063	/		
	2.990	+0.005/-0.000	2.990	/		
	5.237	+/-0.030	4.940		✓	Acceptable
	2.600	+0.005/-0.000	2.600	/		
	2.686	+0.005/-0.000	2.691	/		
	2.770	+0.005/-0.000	2.775	/		
	2.854	+0.005/-0.000	2.859	/		
	2.938	+0.005/-0.000	2.943	/		
	3.021	+0.005/-0.000	3.026	✓		
	3.133	+0.005/-0.000	3.138	/		
	3.179	+0.005/-0.000	3.184	/		
SIDE B	0.200	+/-0.010	0.200	/		
	R0.063	+/-0.010	R0.063	/		
	2.990	+0.005/-0.000	2.995	/		
	5.237	+/-0.030	4.940		✓	Acceptable
	2.600	+0.005/-0.000	2.605	/		
	2.686	+0.005/-0.000	2.691	/		
	2.770	+0.005/-0.000	2.775	/		
	2.854	+0.005/-0.000	2.859	/		
	2.938	+0.005/-0.000	2.943	/		
	3.021	+0.005/-0.000	3.026	/		
	3.133	+0.005/-0.000	3.138	/		
	3.179	+0.005/-0.000	3.184	/		
	124.36	+/-0.020	124.360	✓		

Measured by: G.M	Audited by: ALM	Prototype Approval:	N/A
Date: 09.01.06	Date: 9.01-06	Date:	N/A

Rev	Date	Change	Revised by	Approved
A	05.04.27	New Issue (P/O D412-664-201)	KJ/JLM	
B	06.03.09	Tolerance for 5.237 was +/-0.001	KJ/JLM	
C	07.05.08	Dwg Rev. updated	KJ/JLM	

W/O:		WORK ORDER CHANGES					
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Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries



DESIGN <i>PH</i>	DRAWN BY <i>PH</i>	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED <i>J</i>	APPROVED <i>[Signature]</i>	DRAWING NO. D212-664-241	REV. C SHEET 1 OF 3
DATE 07.03.08		TITLE CROSSTUBE ASS'Y (205/212 HI AFT) NTS	
A	00.12.12	NEW ISSUE	
B	05.02.04	ADD HOLES FOR COMPATABILITY WITH BHT/AA SKIDTUBES	
C	07.03.08	REMOVE -1009 ABRASION STRIP; ADD MAGNOBOND 6398, CUSHION, REVERSE CLAMPS	

RELEASED
07.04.24
PER E.E.N. 005

Qty	Part Number	Description
X	D212-664-241	CROSSTUBE ASSEMBLY (205/212 HIGH AFT)
1	D6006-129	CROSSTUBE
2	D2940-1	SUPPORT
4	D3595-063-530	RUBBER CUSHION
4	MS21920-28	CLAMP (OR MS21920-30)
A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

GENERAL NOTES:

- 1) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- 2) MATERIAL: MANUFACTURED FROM D6006-129
FINISHED LENGTH = 124.36 ± 0.020
- 3) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 4) PART IS SYMMETRIC ABOUT CENTERLINE
- 5) RUN-OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 6) BEND PROGRESSIVELY WITH A MINIMUM OF 5 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 7) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 8) SCRIBE DART PART NUMBER AND BATCH NUMBER IN THIS AREA WITH VIBRATING STYLUS.
- 9) INSTALL D2940-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 10) INSTALL MS21920-28 CLAMPS WITH D3595-063-530 RUBBER CUSHIONS TO SECURE D2940-1 SUPPORT ON TOP SIDE OF CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE SUPPORT
NOTE: MS21920-30 CLAMPS CAN BE USED TO ACCOMMODATE VARYING DIAMETERS. ENSURE THERE IS A MINIMUM OF 1.5 THREADS IN SAFETY ON THE NUTS.
- 11) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 12) TORQUE CLAMPS 80 TO 100 IN-LB.

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DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

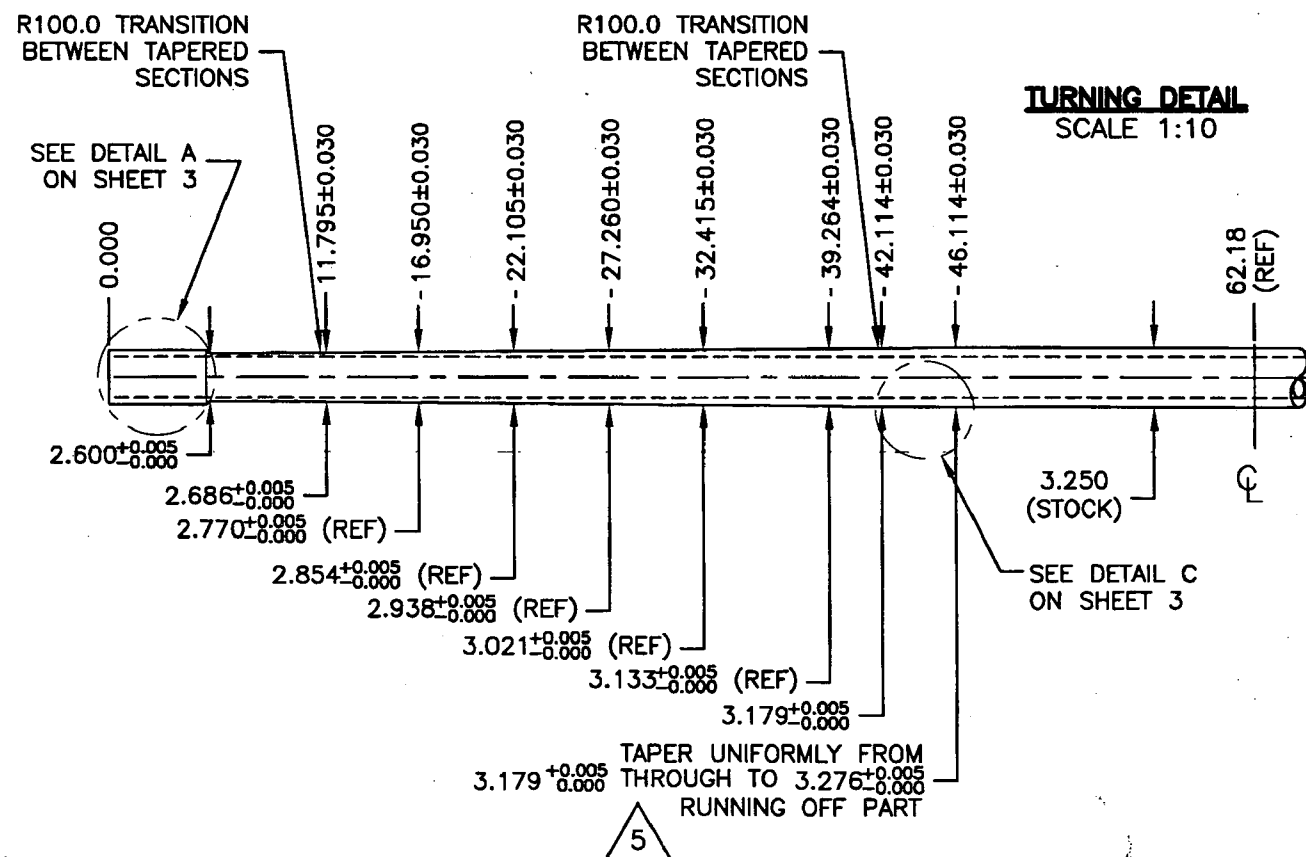
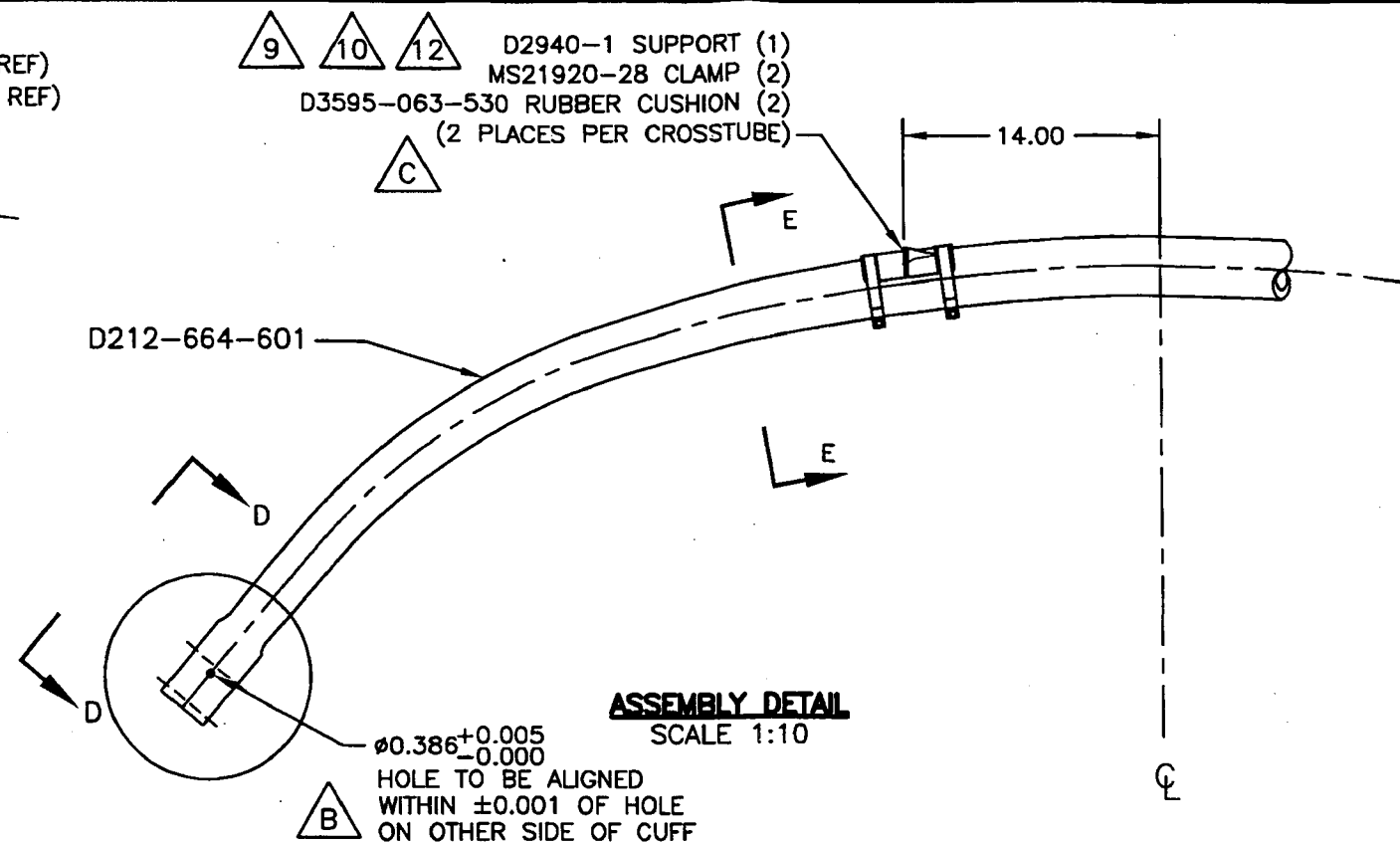
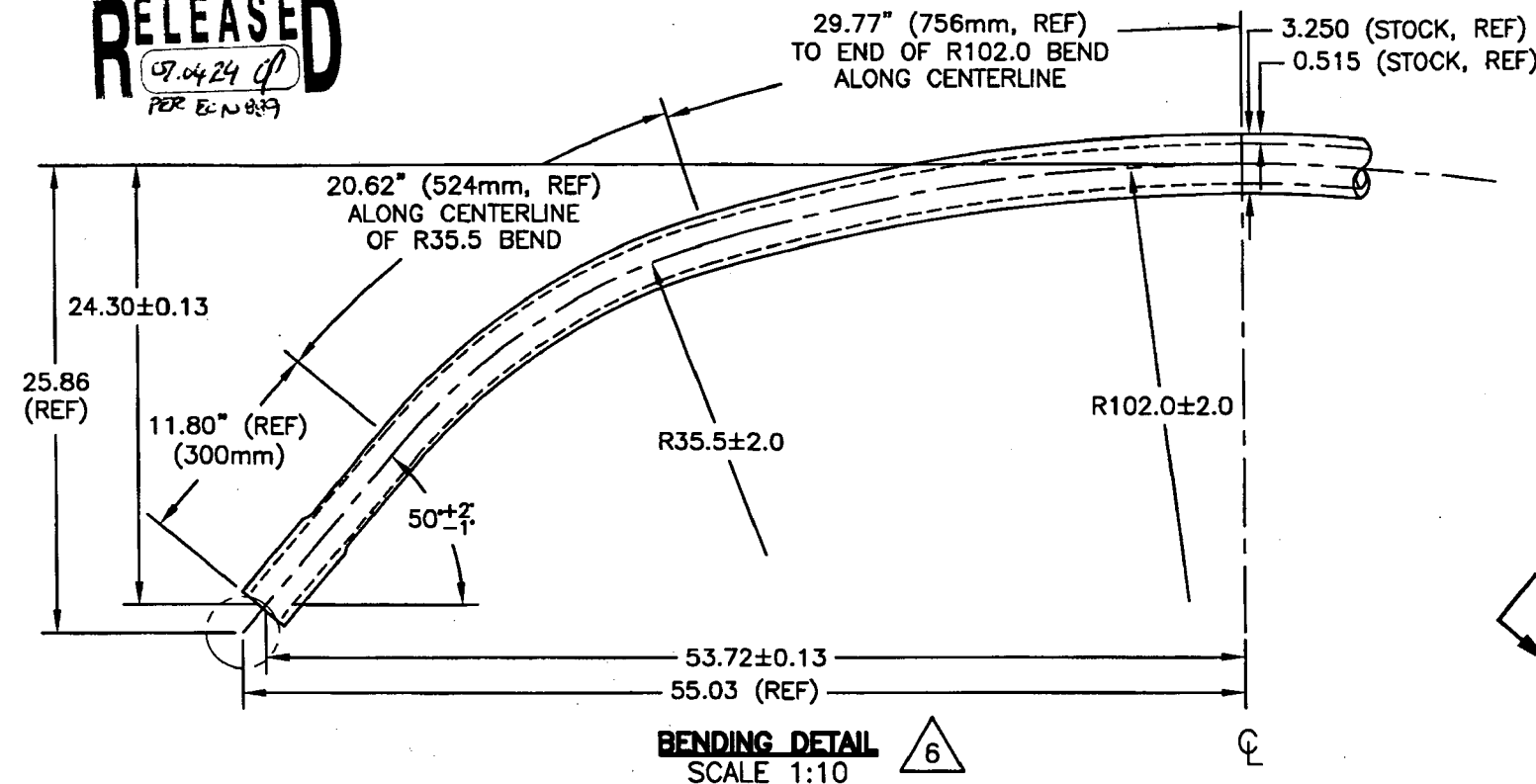
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Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

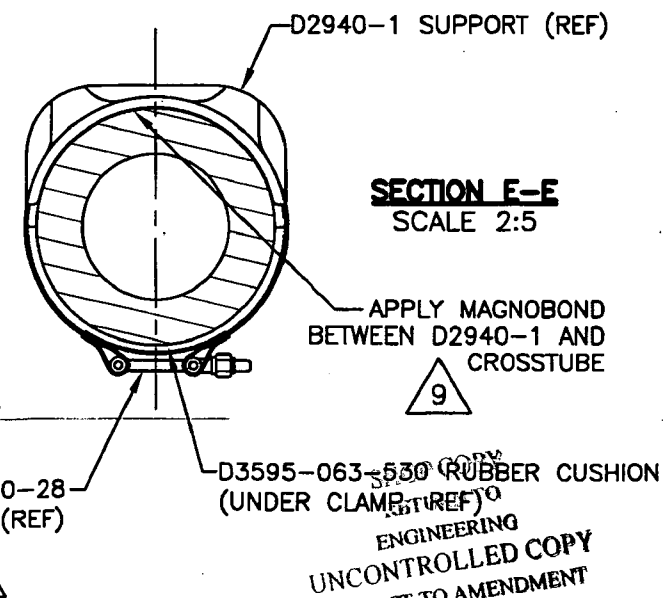
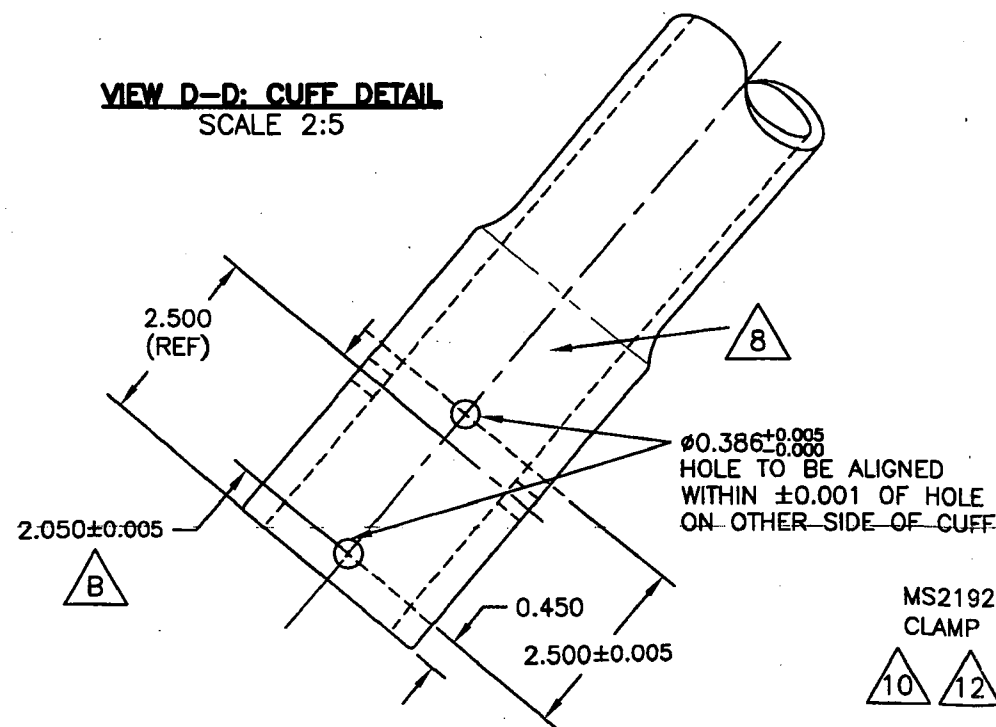
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NOTE: Date & initial all entries

RELEASED
07.04.24
PER E-N 839



VIEW D-D: CUFF DETAIL
SCALE 2:5



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DESIGN

PH

DRAWN BY

PH

CHECKED

APPROVED

DATE

07.03.08

DART

DART AEROSPACE LTD.
HAMMERSBURY, ONTARIO, CANADA

DRAWING NO.
D212-664-241

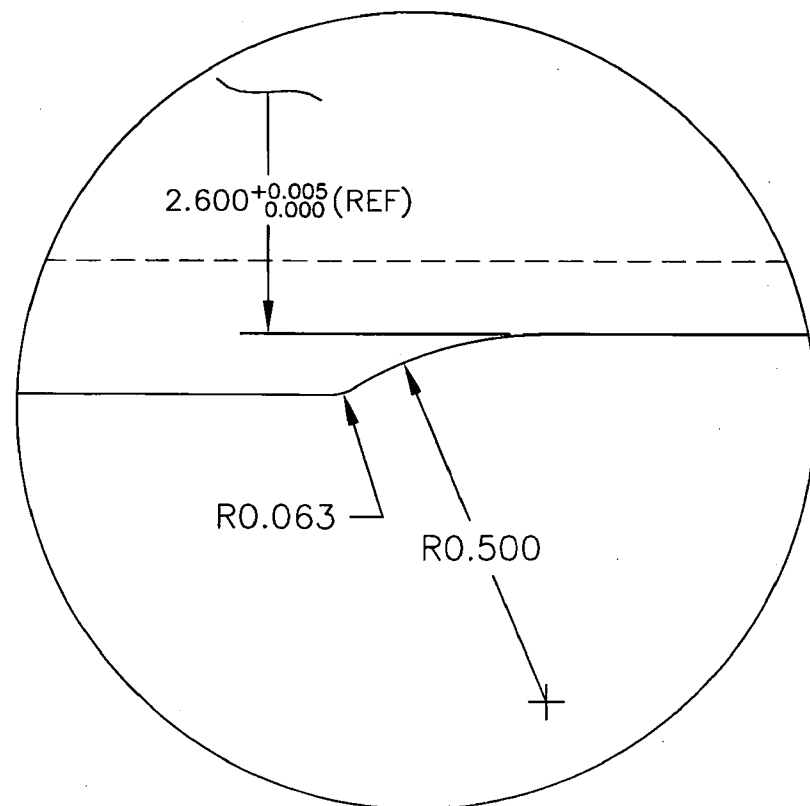
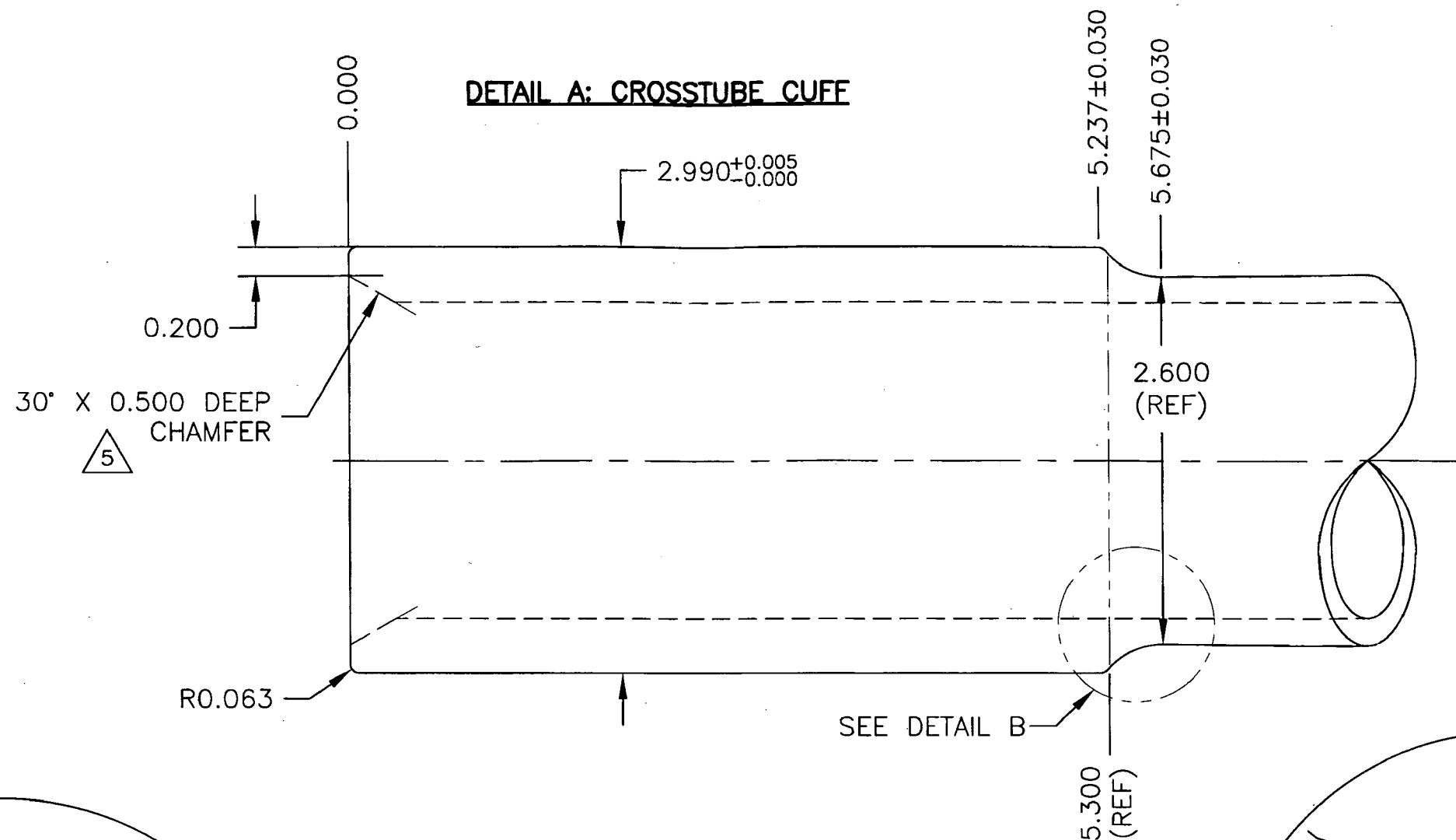
REV. C
SHEET 2 OF 3

TITLE
CROSSTUBE ASS'Y (205/212 HI AFT) 1:10

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WORK ORDER
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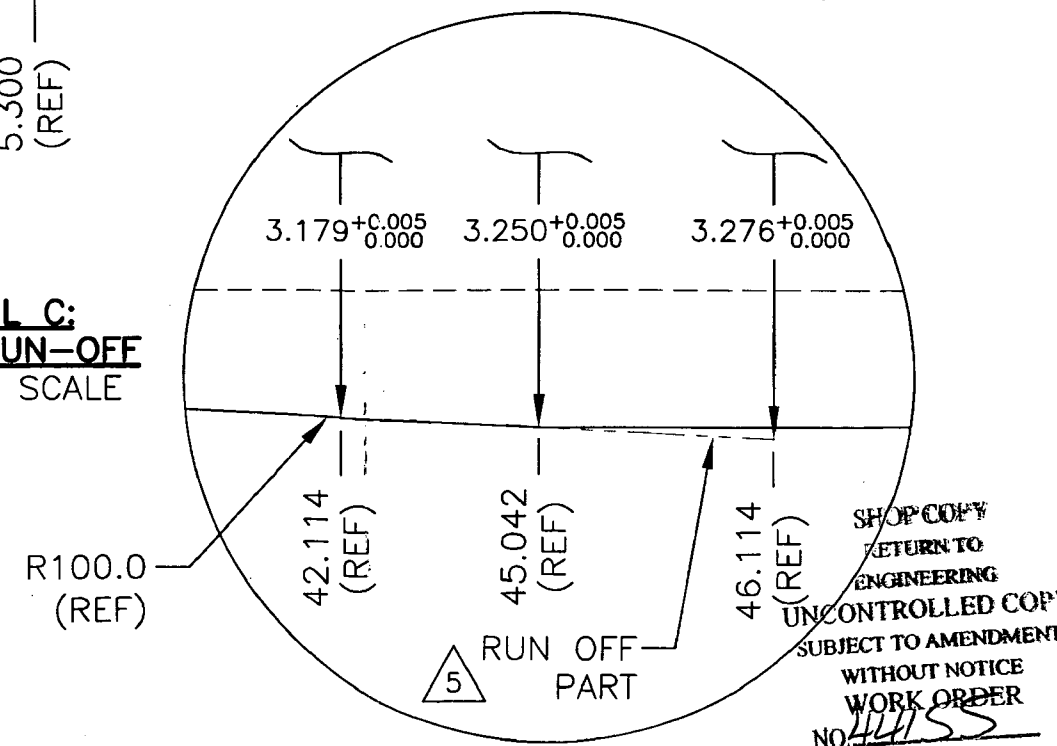
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07.04.24
PER ECN 889

DETAIL A: CROSSTUBE CUFF



**DETAIL B: CUFF
TRANSITION
SCALE 4:1**

**DETAIL C:
TAPER RUN-OFF
NOT TO SCALE**



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DESIGN

PH

DRAWN BY

PH

CHECKED

PH

APPROVED

PH

DATE

07.03.08

TITLE

CROSSTUBE ASS'Y (205/212 HI AFT)

DART

DART AEROSPACE LTD.
HAWKESBURY, ONTARIO, CANADA

DRAWING NO.

D212-664-241

REV. C

SHEET 3 OF 3

SCALE

1:1

